

NAVAL MEDICAL RESEARCH AND DEVELOPMENT NEWS

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Admiral Holds All Hands to Discuss Sequestration and Other Fiscal Challenges

SILVER SPRING, Md. - Rear Adm. Bruce A. Doll, Deputy Chief, M2, Navy Medicine Research and Development, held an All Hands at the Naval Medical Research Center (NMRC) to discuss the sequestration, pending civilian furloughs, debt ceiling concerns and other fiscal challenges ahead in 2013. This was one in a series of meetings and conference calls that engaged all eight laboratories and more than 1,600 personnel within the global NMRC enterprise.

Doll began by summarizing three events in 2013 that will have a financial impact on Navy Medicine research and development. These are the sequestration, which includes the civilian furloughs; the status of continuing resolution; and the pending debt ceiling discussions set for later in May.

The admiral outlined the furlough process and pointed out that it was not a layoff, as some in the media were calling it, but a planned furlough. He then spoke about leadership's proactive planning to meet the research and development mission during these fiscally constraining times.

"The leadership of all the commands has the responsibility to look at these variables and the current and potential budget cuts and figure out what is the best strategy to support the mission of the Surgeon General. No one in leadership is taking this



Rear Adm. Bruce A. Doll, M2, Deputy Chief, Commander of Navy Medicine Research and Development.

lightly – because it is challenging to everyone, personally and professionally, so this is going to take a lot of planning. Leadership at all of the commands is engaged in planning, and part of that includes reaching out to our funding sponsors to get a better understanding of their priorities and where R&D fits into those priorities," Doll said.

He emphasized the importance of prioritizing research projects and

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NMRC Commanding Officer's Message

For the next several months the sequestration and furloughs, the continuing resolution and federal budget, and the discussions and debates on the debt limit ceiling will continue to be significant issues for our research enterprise, requiring us to be flexible and creative, and most importantly, to stay focused on our mission.

As I write, sequestration appears to be occurring. Approximately 800,000 civilian DoD employees could be furloughed in April. These furloughs will be implemented with consistency across DoD. Most civilians will be furloughed with few exceptions, including the 227 GS staff in the NMRC enterprise. I am most concerned about the personal impact on our employees, but there will obviously be potential impact on the execution of our research as well.

As we plan for the furlough and other potential budget shortfalls, we are working closely with BUMED to provide them information on our mission and our personnel as they work with Navy and DoD levels about them to share and interpret policy. I remain committed to providing you with the most current information and directing you to available resources to help you and your families. Thank you for your patience as we navigate these difficult issues.



NMRC Commanding Officer sends,
John W. Sanders III, CAPT, MC, USN



NAMRU-3 Commanding Officer's Message

January 25, 2011, Egypt's revolution forced a shift in leadership that immediately caused changes to the geopolitical climate and created economic, social and technological upheaval throughout the country. Massive disorganization in leadership spread throughout all government sectors, resulting in anxiety, fear and despondence. The instability of the government coupled with daily civil unrest impacted NAMRU-3 activities. Nevertheless, NAMRU-3 leadership quickly formulated a new paradigm to cope with the daily changes.

My previous experiences at NAMRU-2/NAMRU-3 enabled me to make immediate adjustments to lead the team to accomplish the mission, which extends beyond Egypt. In Egypt, we continue to engage with the Ministry of Health and institutions such as Cairo University through joint collaboration. NAMRU-3 also partners with the Eastern Mediterranean Regional Office of the World Health Organization as a reference lab helping host countries to detect emerging/re-emerging diseases of public health importance such as the recent outbreaks of the novel Coronavirus and yellow fever.

NAMRU-3 serves three COCOMs: CENTCOM, AFRICOM and EUCOM, and has 63 projects in 23 countries with 326 staff members. Recently, NAMRU-3 leadership visited USAMRU-Kenya to discuss ways the commands could develop joint research protocols geared towards AFRICOM and other regions of interest. This jointness through research collaboration will enable both commands to more effectively accomplish their missions and also bring more value to the research efforts. On a different front, NAMRU-3 continues to seek innovative ways to build collaboration by partnering with the Ghana Medical Armed Services and the Noguchi Memorial Research Institute, where NAMRU-3 Detachment-Ghana is located; to build medical research capacities in West Africa to enhance mil-to-mil relationships, and with other partners in Côte d'Ivoire, Burkina Faso, Togo and Nigeria.

Meanwhile, NAMRU-3 is prepared for a possible evacuation. The Continuity of Operations Plan (COOP) is in place. The safe haven is stocked with ready-to-eat meals and water. The command is guided 24/7 by U.S. Embassy Regional Security personnel with enhanced security checks at the gate and regular emergency drills. By working very closely with the U.S. Embassy, NAMRU-3 leadership is actively adapting to the changing situation in Egypt to accomplish our mission both in our host country and throughout the region.

NAMRU-3 Commanding Officer sends
Buhari A. "Tony" Oyofe, CAPT, MSC, USN

NAMRU-3 Researchers Work in Bulgaria to Track Hantavirus

From NAMRU-3 Public Affairs

CAIRO - The Viral and Zoonotic Diseases Research Program (VZDRP) at the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) recently completed a project started three years ago in Bulgaria on hantavirus surveillance in humans and rodents. This project supported the international agreement on International Health Regulations to prevent and control the spread of disease in developing countries by strengthening their capacity for surveillance and control.

Hantaviruses, whose natural reservoirs are wild rodents, cause hemorrhagic fever with renal syndrome in many parts of the world. New virus strains are continuously being discovered.

The NAMRU-3 project began with a hospital-based study on acute febrile illness cases. Samples were collected from febrile patients from five hospitals in Bulgaria.

"Through GEIS (DoD Global Emerging Infections Surveillance and Response System) funding, NAMRU-3 established a state-of-the-art molecular and serologic diagnostic lab in Sofia's National Center for Infectious and Parasitic Diseases (NCIPD) for screening the acute febrile illness



Researcher identifies trapping sites in Southern Bulgaria as part of a NAMRU-3 support surveillance study to block hantavirus infections.



NAMRU-3 and Bulgarian researchers trap rodents as part of hantavirus surveillance in humans and rodents. Photos provided by NAMRU-3 Public Affairs.

(AFI) samples," said Dr. Emad Mohareb, NAMRU-3's principal investigator on this effort. "NAMRU-3 provided equipment and training to their eager Bulgarian collaborators, which included biosafety training, lab processing of tissues and rodent collection procedures."

With NAMRU-3 providing periodic quality assurance/quality control and proficiency testing support to the NCIPD, one hantavirus species named *Dobrava* was identified as the main hantavirus species in human serum samples in Bulgaria. The next phase of the project was to confirm the reservoir host. VZDRP's Dr. Emad Mohareb and Mustafa Abdel Aziz, NAMRU-3 Animal Research Department's Dr. Fady Guirguis, and Bulgarian research collaborators conducted rodent surveillance and trapped several species of rodents in areas with documented human cases.

Working with their Bulgarian collaborator, Dr. Iva Christova from the NCIPD, and other researchers from the Ministry of Health and the University of Plovdiv, the team identified trap-

ping sites in southern Bulgaria and Burgas in eastern Bulgaria. On two successive nights each month, rodents were trapped. Temperature, humidity and GPS coordinates were recorded. The team trapped 752 rodents and identified 13 different rodent species. Using testing by polymerase chain reaction, the investigators determined that the yellow-necked mouse (*A. flavicollis*) is the most common reservoir for the virus, and species identification has verified the circulation of only *Dobrava* hantavirus in villages where the rodents were collected.

The collaborative partnership of NAMRU-3 and the Bulgarian health and research institutions has gone a long way to strengthen the country's public health surveillance network and better equip them to readily detect future hantavirus outbreaks in the human population.

Capt. Buhari Oyoyo, NAMRU-3 commanding officer, concluded, "This is why NAMRU-3 is focused on building medical capacities in developing countries to help in pathogen detection and enhance quality of life."

NMRC's Neurotrauma Department Tackles Head Injury

By Lt. Jacob Norris and Dr. Charles Auker, NMRC Neurotrauma Department

SILVER SPRING, Md. - Over the last two years, the Neurotrauma Department at the Naval Medical Research Center (NMRC) has intensively studied the effects of blast overpressure on the human body with the end goal of improving operational readiness for warfighters across all services.

Mild traumatic brain injury (TBI), better known as concussion, has been the number one battle injury over the last decade in large part related to improvised explosive devices (IEDs) and roadside bombs. Much of the research and development efforts within the Neurotrauma Department have focused on the effects of blast overpressure on the brain. Researchers study low-intensity blast in order to understand the development of post-traumatic stress disorder (PTSD)-like symptoms in blast-exposed individuals' neurovascular function, namely the endothelial glycocalyx, and potential behavioral deficits. The department has studied the correlation between levels of blast pressure and the accompanying pressure changes in the brain.

Not all research efforts focus solely on blast; researchers are also studying



Marines and their instructor brace against the blast of a door charge, January 10, at Engineer Training Area 3. For many of the junior Marines it was their first time doing a live fire urban breaching exercise, said Sgt. Richard Hill. And it was important for them to get the training since Charlie Company wouldn't have time to go through Mojave Viper training in Twenty-Nine Palms, Calif., before their scheduled deployment. Photo by TSgt John Herrick.

TBI outcome of stress and of prolonged transport are also being studied.

Focusing on a specific Department of Defense population, the Neurotrauma Department is researching the

experienced breacher personnel are tracked during training evolutions for development of physiological, cognitive or symptomatic complaints. In this same effort, the Navy has partnered with the National Institute of Neurological Disorders and Strokes to bring select personnel into the laboratory for a detailed examination to detect any health abnormalities or cognitive deficits using advanced imaging techniques.

The work of the Neurotrauma Department is vital to the mission of Navy Medicine and its promise to care for sailors and Marines. A better understanding of head injury will translate to improved knowledge of mental health and yield a positive impact for frontline providers in both expeditionary and medical treatment facility settings. Teaming with Army counterparts ensures findings will be translated across services, strengthens jointness in medical research and development, and provides enhanced value to beneficiaries.

Researchers study low-intensity blast in order to understand the development of post-traumatic stress disorder (PTSD)-like symptoms in blast-exposed individuals' neurovascular function...The department has studied the correlation between levels of blast pressure and the accompanying pressure changes in the brain.

head trauma within the context of polytrauma. This work is using laboratory models of TBI with and without additional injuries to assess the efficacy and safety of acute interventions such as oxygen therapeutics (e.g., perfluorocarbons or hemoglobin-based oxygen carriers) for use in the pre-hospital environment. The effects of

effects of chronic, low-level blast exposure in service members known as dynamic entry personnel or breachers. While seldom diagnosed with head injury, it is reasoned these personnel may be at increased risk of long-term or recurrent health issues. In a joint Navy-led effort with the Walter Reed Army Institute of Research,

NAMRU-6 Bacteriology: Countering the Threat of Diarrhea and the Development of Multi-Drug Resistant Organisms

From NAMRU-6 Public Affairs

LIMA, Peru - Infectious bacteria have been causing problems for military campaigns since time immemorial. At the forefront has always been diarrhea, and with every deployment or armed conflict, diarrhea has taken its toll on unit readiness. To counter this burden, the overseas medical research labs are investigating and developing strategies to mitigate the detrimental effects of bacterial diarrhea. Surveillance networks have been set up to determine the most common causes of diarrhea within our troops and which bacteria are responsible for the most severe illness worldwide.

At the U.S. Naval Medical Research Unit No. 6 ([NAMRU-6](#)), researchers focus on diarrhea occurring among travelers to Peru, troops deployed as

part of operations New Horizons and Beyond the Horizons, and within the local populations to get a pulse on which bacteria are causing diarrhea in South America and to determine whether these bacteria are developing resistance to the antibiotics commonly used to treat these cases. This has become vital information in the development of countermeasures to keep troops healthy and to focus Department of Defense vaccine development efforts.

NAMRU-6 researchers are involved in the preclinical trials of novel vaccines against some of the most common bacterial cause of travelers' diarrhea. Vaccines against *Campylobacter*, enterotoxigenic *Escherichia coli* (ETEC), and *Shigella* are currently under development with the assistance of the Military Infectious Disease Research Program

(MIDRP). These vaccines have the potential to provide needed protection against the morbidity associated with these common causes of diarrhea.

Another potential morbidity for deployed service members involves wound infections. Wound infection and hospital-acquired infections have become more difficult to treat in recent years due to multi-drug resistant bacteria, which are harder to kill with standard antibiotics. As shown in recent conflicts in Southwest Asia, these bacteria have complicated hospital courses for wounded service members and have proven to be a global health threat. NAMRU-6 is spearheading surveillance in South America for the presence of resistant organisms with the potential to cause severe hospital or wound infections. In concert with multi-

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Graduating class of the first five-week laboratory training course held at NAMRU-6, Universidad Nacional Mayor de San Marcos, San Marco, and Universidad Peruana Cayetano Heredia, as part of the PROMELA program, October 2012. With the support of the CDC and DHAPP, this laboratory improvement program is now helping over fourteen regional laboratories within eight countries throughout Latin America, including eleven partner military laboratories. Photo provided by NAMRU-6 Public Affairs.

NAMRU-3 Establishes Mosquito Colony to Study Malaria

From NAMRU-3 Public Affairs

CAIRO - Diagnostic support and research for infectious diseases of public health concern lie at the heart of the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) mission. Malaria is one of the most devastating diseases in the U.S. Africa Command (AFRICOM) region. In order to further research on malaria, NAMRU-3's Vector Biology Research Program (VBRP) is working to establish an *Anopheles* mosquito colony. Because Fayoum Governorate, an oasis located about 40 miles from Cairo, is an endemic area of Egypt's malaria vectors, *Anopheles sergentii* and *An. pharoensis*, it was selected as the collection location.

The VBRP team of entomologists, headed by Lt. Joseph DiClaro, began the mosquito colony project in 2010 with plans to make field trips to collect mosquito larvae. However, field visits were curtailed by the U.S. Embassy Regional Security Office (RSO) due to unrest after the Egyptian revolution. Over two years later, RSO approval for field visits to the Fayoum oasis was finally granted.

To establish a lab colony from a wild strain, large numbers of mosquitoes need to be collected from the field.

"It is usually very difficult to adapt field-caught mosquitoes to lab conditions and there is high mortality," team leader Dr. Alia Zayed said. "We have to keep collecting until we succeed in establishing the colony."

The first collection trip took place in December 2012, when the larval population of *Anopheles* mosquitoes, especially the *An. sergentii*, is considerably greater. The objective of the first trip was to locate mosquito breeding sites. With the help of local villagers, the NAMRU-3 team



Mrs. Reham, Mrs. El Shaimaa Nour Eldin, and Lt. DiClaro (center) use dipplers to find *Anopheles* mosquito larva in Fayoum canal as part of NAMRU-3's effort to establish a mosquito colony to study malaria. Photo by Dr. Alia Zayed.

checked for mosquito larvae at more than ten collection sites in irrigated farmland and irrigation canals in the Si-noris and Ibshway districts. Three genera of mosquitoes were collected: *Culex*, *Culiseta*, and *Anopheles*.

VBRP was able to make a second collecting trip to the same areas with DiClaro, who said, "Several more trips are planned to the Fayoum oasis throughout the spring to provide the insectary with large numbers of mosquitoes in order to establish and maintain the colony."

Countering the Threat of Diarrhea and Resistant Organisms

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ple military and civilian hospitals in Lima, Peru and in the Amazon town of Iquitos, isolates known to cause hospital-acquired infection and those associated with wound infections are collected and analyzed for the emergence of resistance and for virulence factors that make them more deadly. Through these efforts, researchers are beginning to fully grasp the scope of the problem and to develop strategies to counter this global health threat.

NAMRU-6 researchers are also involved in HIV prevention and treatment as well as the study of other sexually transmitted infections. Over the last couple of decades, the world has endured the burden of HIV infection as well as steadily increasing gonorrhea

resistance. At NAMRU-6, researchers are part of a larger global surveillance network monitoring the development of gonorrhea resistance and the burden of sexually transmitted infection within Latin America as part of the Global Emerging Infectious Disease Surveillance (GEIS) program. Researchers are working closely with the Defense HIV/AIDS Prevention Program (DHAPP) and the armed forces of partner countries within South America to develop self-sustaining HIV prevention and treatment programs. Part of this effort has led to collaboration with the U.S. Centers for Disease Control and Prevention to improve military laboratories throughout South and Central America. In order to accomplish this mission, NAMRU-6 researchers created the

PROMELA (Programa de Mejoramiento de Laboratorios de Las Fuerzas Militares de Latinoamerica) program, and they are working with the Armed Forces of Peru, Colombia, Nicaragua, Honduras, El Salvador, Guatemala, Belize and the Dominican Republic to improve the laboratory services each country provides to its service members.

Although the Bacteriology Department at NAMRU-6 is only one department in one overseas lab, it is part of a bigger system whose strength is in its connectivity to the region and its ability to form channels of communication between institutions and researchers with a common goal. Through this teamwork, progress toward mitigating and/or eliminating infectious disease threats will remain progressive.

NHRC Provides Modeling Solutions for Joint Medical Planners

By Vern Wing, NHRC

SAN DIEGO - The Naval Health Research Center (NHRC) developed a suite of medical planning models that are providing the joint medical planning community with a robust capability to conduct end-to-end modeling of the expeditionary medicine mission. Estimating the medical requirements for treating illnesses and injuries incurred during military operations is a critical component of the expeditionary medical resource planning process.

NHRC began development of the Joint Medical Planning Tool (JMPT) in the early 1990s under an initial grant from the Naval Bureau of Medicine and Surgery (BUMED). This effort was designed to fill a gap in the ability to conduct analysis of far-forward medical treatment using modeling and simulation. Originally, JMPT concentrated on first responder and forward resuscitative care. Focused on USMC scenarios and capabilities, it provided the capability to model patient stream generation, medical treatment, and intra-theater transportation and included a robust reporting capability. Included were patient condition-based medical treatment task profiles, which specified supply use at the National Stock Number level of detail. Further development enabled JMPT to include theater hos-

JMPT was designed to fill a gap in the ability to conduct analysis of far-forward medical treatment using modeling and simulation.

pitalization and expanded the representation of medical treatment facilities and transportation assets to include all the services. Over the years, JMPT was used to support over 22 studies and analyses for 16 customers DoD-wide.

Formal verification and validation testing commenced in the summer of 2012, and JMPT was accredited by the Force Health Protection Integrating Council (FHPIC) as a DoD medical planning and programming tool author-

Joint Medical Planners Toolkit.

Joint Medical Planning Toolkit

A suite of tools to support medical planners, analysts, and logisticians



The PCOF tool projects probability of injury and illness across the ROMO.

CIRCIT provides casualty estimates for combat, HA, and DR missions.

EMRE estimates blood, OR, ICU, and evacuation requirements as a function of patient load.

ized for use in medical systems analysis, logistical analysis, operational risk assessments, and theater medical course of action assessments. JMPT became the joint standard for medical modeling and simulation. In January 2013, JMPT was granted an Authorization to Operate (ATO) by U.S. Fleet Cyber Command and was granted a type of accreditation that permits use on Navy networks. ATOs for the other service networks are in process.

NHRC has also developed a suite of three other tools collectively known as the Medical Planners Toolkit (MPTk). MPTk consists of (1) the Patient Condition Occurrence Frequency (PCOF) tool, (2) the Casualty Rate Estimation Tool (CREstT), and (3) the Expeditionary Medicine Requirements Estimator (EMRE).

PCOF tables provide the probabilities of specific disease and injury types sustained during a contingency response. The medical planning community lacked a functional and accurate means of estimating PCOFs for different operational scenarios. This tool provides the capability to access evidence-based baselines and gener-

ate user-defined estimates tailored to a specific operation. The tool provides the capability to generate PCOF distributions for humanitarian assistance (HA) and disaster relief (DR) missions as well as various combat operations. The PCOF tool was accredited by the FHPIC for DoD-wide use.

Patient streams used in modeling are constructed by combining a casualty estimate with a PCOF distribution. Medical planners lacked a standardized, science-based process to estimate casualties. CREstT fills this gap. This fast-running tool provides casualty estimates for ground-combat, shipboard, and fixed installations as well HA and DR scenarios. CREstT employs empirical data fitted to probability distributions to produce casualty estimates for wounded in action, nonbattle injury, and disease.

The EMRE tool provides time-phased estimates for the operating room tables, intensive care unit beds, ward beds, evacuee numbers, and blood supplies necessary to Level 3 requirements. These estimates can be used to initialize the force laydown in JMPT.

NMRC Researchers Are Studying Resuscitation Fluids in the Laboratory to Help Corpsmen in the Field Save Lives

SILVER SPRING, Md. - The Naval Medical Research Center's (NMRC) Department of Regenerative Medicine is one of the world's premier military laboratories committed to cutting-edge translational research and personalized medicine. The mission of the research team is to understand the body's response to injury and develop improved diagnostics, therapeutics and decision support tools for combat-related injuries. The unique collaboration among physicians, scientists, engineers and mathematicians enables the team to bring a broad variety of expertise to an effort to solve important but difficult clinical and operational medical problems. One of these problems is developing a better battlefield resuscitation fluid.

The wars in Afghanistan and Iraq have resulted in the highest rates of combat casualties for the U.S. and coalition forces since the Vietnam conflict, and deaths from close proximity blast injury patterns are the most common. Catastrophic hemorrhage is responsible for up to fifty percent of trauma deaths on the battlefield. A new resuscitation fluid could bring those numbers down on the battlefield and in the civilian setting.

Current resuscitation fluids basically replace the volume of lost blood but do not have any of the properties of blood (oxygen and nutrient delivery, removal of carbon dioxide, etc.) and do not protect against the damage induced by the oxygen deprivation caused by the blood loss, such as the buildup of metabolic byproducts.

"We are working with Dr. Geoffrey Dobson at James Cook University in Australia investigating a combination of three FDA-approved drugs – Adenosine, Lidocaine, and Magnesium Sulfate (ALM) – in a sterile saline solution," said Dr. Doug Tadaki, deputy head of NMRC's Department of Regenerative Medicine. "This combination is used as a resuscitation fluid that provides a small increase in volume, but more importantly the drug



FORWARD OPERATING BASE FARAH, Afghanistan - Chief Hospital Corpsman Joshua Ives, right, leading chief petty officer for Provincial Reconstruction Team (PRT) Farah base aid station, squeezes gel into the hand of U.S. Army Maj. Cleve Sylvester, commander of the 541st Forward Surgical Team (Airborne), in preparation for an ultrasound on a wounded Afghan policeman. Four members of the Afghan National Police (ANP) involved in an improvised explosive device were treated by PRT Farah medical personnel, the 541st Forward Surgical Team (Airborne) and coalition force medics at the Forward Operating Base Farah aid station. Photo by Lt. j.g. Matthew Stroup.

stabilizes the heart and blood vessels and decreases the inflammation triggered by the loss of blood and has shown efficacy at increasing survival in laboratory models of hemorrhage."

The drug combination is also unique in that it seems to decrease the body's need for oxygen by twenty-seven percent. This small-volume resuscitation strategy demonstrates better survival than the current standard of care with the added benefit of decreasing the pack weight of the corpsman or medic by reducing the total amount of fluid carried.

"We are also examining ALM for protective benefit to the brain following blast-induced traumatic brain injury," added Tadaki. "An interna-

tional DoD partnership called The Technical Cooperation Program (TTCP), a five-nation consortium made up of the U.S., U.K., Canada, Australia and New Zealand, is now conducting joint studies on the use of ALM to treat a variety of battlefield injuries."

Combat casualty care is the center of what this research team does. Working together with the Department of Surgery at the Uniformed Services University, the Walter Reed National Military Medical Center and civilian academic partners, this team is conducting translational research from the battlefield to the bedside that is designed to benefit the wounded warfighter.

NAMRU-3 Participates in Human Research Protection Training

From NAMRU-3 Public Affairs

CAIRO - The Human Research Protection Program involves everyone at the U.S. Naval Medical Research Unit No. 3 ([NAMRU-3](#)). Major components of the program are the conduct of research, training and awareness of research-related issues, recordkeeping, and research review.

In January a three-person inspection team from the Department of the Navy Human Research Protection Program (DON HRPP) arrived to review the laboratory's program and provide training. The three-person team consisted of Capt. Alan F. Nordholm, director of the DON HRPP, Bridget Arnwine and Derek Englis. The team conducted group meetings as well as interviews with principal investigators, program leadership, and members of the Institutional Review Board (IRB) and the Science Review Board. The DON HRPP team also provided training on important human research protection issues like informed consent and the involvement of children and pregnant women in research, which are always of significance to the NAMRU-3 IRB.

Englis said, "It was an honor for the DON HRPP team to be able to meet and become acquainted with NAMRU-3 staff members; to learn about their mission of providing research support and surveillance across AFRICOM, CENTCOM and EUCOM; to observe their dedication to researching and fighting the debilitating diseases of the area; and to see their dedication to the protection of human subjects. NAMRU-3 staff members are truly ambassadors



Capt. Nordholm, director of DON HRPP, conducts training for NAMRU-3 researchers. Photo by Bridget Arnwine, DON HRPP.

for Navy Medicine."

The team also introduced a web-based administrative protocol management system called PROMIS, which is available to NAMRU-3.

At the conclusion of the visit, Dr. Mohamed Abdel Fattah, the NAMRU-3 human research protection officer, said, "They were assured of our professionalism and competence to be involved in research."

NAMRU-3 Promotes Quality and Safety of Egyptian Healthcare through Hospital-acquired Infection Surveillance

CAIRO - The Global Disease Detection and Response Program (GDDRP) at the U.S. Naval Medical Research Unit No. 3 ([NAMRU-3](#)) is working with the Infection Control Department at the Egyptian Ministry of Health to improve the quality and safety of healthcare in Egypt. This program, funded by the U.S. Agency for International Development, focuses on hospital-acquired infection (HAI) surveillance activities in 28 hospitals in Egypt, including 93 intensive care units (ICUs) in Cairo, Alexandria, Minya, Luxor and South Sinai (five geographically representative governorates).

"The long-term plan is to expand the surveillance program to all intensive care units in Egypt over the next three years," said Dr. Maha Taalat, NAMRU-3 lead investigator in the NAMRU-3 Infection Control Program. "This will allow us to have a national surveillance program for HAIs and antimicrobial resistance in all intensive care units of Egypt."

The GDDRP's Monitoring and Evaluation team has been the catalyst in setting up this surveillance by con-

ducting over ninety assist visits to these hospitals from May 2011 to January 2013 to evaluate the implementation of the surveillance activities. The GDDRP team's objectives were to provide on-site technical support to the surveillance teams at each hospital and identify the implementation challenges. At visits with each participating hospital ICU, the GDDRP team met with hospital surveillance officers to ensure proper data collection through the use of logbooks and personal digital assistants (PDAs) and to identify issues delaying diagnosis and reporting of suspected HAIs. The team also coordinated with local laboratory personnel to ensure the use of optimal bacterial pathogen identification techniques and timely transport of bacterial isolates to the NAMRU-3 reference lab. They also worked with the hospital data managers to ensure surveillance data were correctly downloaded from the PDAs and sent to NAMRU-3 for analysis. Finally, the team provided refresher training to each hospital's infection control team and discussed surveillance implementation issues unique to each site.

NMRC Researcher Delivers Grand Rounds Talk at Local Hospital

SILVER SPRING, Md. - Lt. Jacob Norris of the Naval Medical Research Center's (NMRC) Neurotrauma Department delivered a Grand Rounds lecture at MedStar National Rehabilitation Hospital February 13 to highlight the role Navy Medicine research and development has played in research on mild traumatic brain injury (mTBI).

To an audience of neurologists, neuroscientists, pathologists and other clinicians from the Georgetown University/National Rehabilitation Hospital, Norris gave an overview of the NMRC enterprise entitled, "Naval Medical Research at Home and Abroad." The talk highlighted the Navy's relationship with the Marine Corps.

"Because of the relationship with the Marine Corps and the Navy's role as an expeditionary force, Navy medical research and development seeks to align itself as an agile asset that can bring resources to bear on medical issues in a timely manner," Norris told the group.

Norris highlighted work from throughout Navy Medicine on the topic of mTBI. As a research psychologist, he discussed NMRC's work on psychometric properties of the Department of Defense's Automated Neuropsychological Assessment Metric (ANAM), which is currently



Lance Cpl. Steven A. Meyer, an engineer with 3rd Combat Engineer Battalion, 1st Marine Division, takes the Automated Neuropsychological Assessment Metrics (ANAM) test at the Concussion Restoration Care Center at Camp Leatherneck, Afghanistan. The ANAM tests neuro-cognitive skills such as reaction time, which doctors can use to monitor the progress of concussed patients. The CRCC is the first clinic of its kind in Helmand Province with a diverse medical staff capable of treating and rehabilitating service members with concussions. Photo by Cpl. Kenneth Jasik.

Medicine's role in concussion research in forward deployed settings. During his deployment, he was part of the U.S. Central Command Joint Combat Casualty Research Team,

following concussion caused by improvised explosive devices and improvements in clinical use of the ANAM.

When asked about the importance of interacting with Navy researchers, Dr. Marilyn Kraus, program director for the Traumatic Brain Injury Research Program and Brain Injury Medicine Fellowship at Georgetown University-Medstar National Rehabilitation Hospital, said, "The collaboration between providers in the military and civilian sectors in efforts to better understand TBI and its impact on function and quality of life, as well as in the development of treatments, is critical."

Kraus added, "It results in more efficient and effective research efforts that will benefit both the military and civilian population with TBI. Putting our efforts together will ultimately benefit the TBI patient to a greater extent than individual efforts."

"The collaboration between providers in the military and civilian sectors in efforts to better understand TBI and its impact on function and quality of life, as well as in the development of treatments, is critical...It results in more efficient and effective research efforts that will benefit both the military and civilian population with TBI. "

used as part of concussion evaluation at the Bureau of Medicine and Surgery/Headquarters Marine Corps Concussion Restoration Care Center (CRCC) in Helmand Province and Task MED Afghanistan's Warrior Recovery Center at Kandahar Airfield.

Norris reviewed part of Navy

where he interacted with Navy clinicians interested in improving care using research. He described how he helped them navigate the regulatory processes and provided statistical and scientific support. He also described the products yielded, which include a published case series on syncope

NAMRU-3 Provides Internships for American University Students

From NAMRU-3 Public Affairs

CAIRO - The American University in Cairo (AUC) is one of the leading institutions of higher education in Egypt. As a part of the U.S. Naval Medical Research Unit No 3 (NAMRU-3) mission to assist local universities, the staff has participated in AUC summer intern programs, "job shadowing" and career employment fairs. When the AUC Career Center contacted NAMRU-3 about a Winter Intern Program for biology majors, the laboratory welcomed three students during their January mid-year break.

Habiba Soliman, AUC sophomore, received theoretical and practical training on several molecular techniques, including methods to purify DNA from vector samples, conventional polymerase chain reaction (PCR) technique and its uses, and gel electrophoresis in the Vector Biology Research Program lab. She was also briefed on good laboratory practices.

Soliman summed up her experiences by saying, "I am proud that I was able to memorize almost all of the steps involved in DNA extraction! I valued this experience."

Dr. Hala Bassaly, who was responsible for Soliman's training, said, "Habiba was enthusiastic about her internship opportunity at NAMRU-3 and showed great interest in learning about vectors and the diseases they transmit. She

had been involved in some molecular biology activities as an assistant to a master's student at AUC, and she was delighted to find an opportunity to get much deeper training on molecular biology techniques in the Vector Biology Research Program lab."

Salma El Sahhar, an AUC senior, did her internship in the Bacterial and Parasitic Disease Research Program (BPDRP) lab. After laboratory safety orientation, El Sahhar trained in the areas of diagnosis using molecular, bacteriology, serology and microscopy techniques. She learned conventional PCR including detection of the amplified products using the agarose gels electrophoresis and visualization of bands under ultraviolet light, sandwich enzyme-linked immunosorbent assay (ELISA), identification of some bacterial isolated and characterization, and on using a microscope to identify enteric parasites.

El Sahhar said her training was really enjoyable. "I learned practical applications after having taken it theoretically at AUC. It was really interesting to see how they are applied in real life. At AUC we worked on parasites and bacteria, but this also provided me the chance to work with other infectious materials." She added, "I liked that people at NAMRU-3 care about your learning something. They wanted to teach me and were happy to do it."

Her mentor, Dr. Hanan El Mohammady, said, "Salma already had the 'know-how' for laboratory internship responsibilities. She was passionate and had the ability to learn new skills and grasp new concepts in the different laboratories."

Sherrie Magdy Salib, also a senior, said this opportunity provided her with lots of practice in the Viral and Zoonotic Disease Research Program lab under very strict safety conditions.

"I really appreciated the friendliness of the people in the lab," she added.

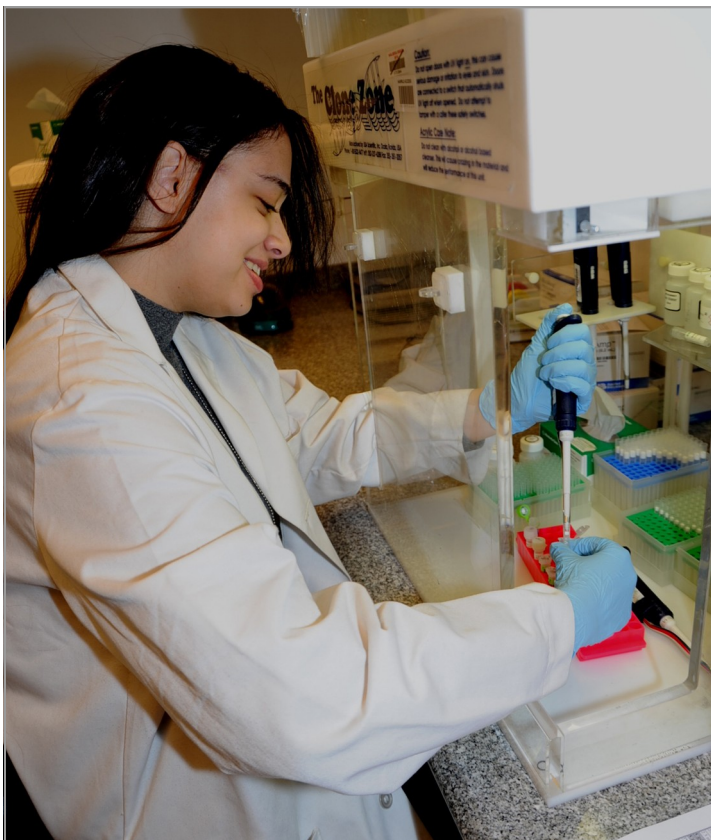
Salib noted that while AUC has many of the same machines as NAMRU-3, she was able to use human cells instead of those from animals. She hopes to return for the summer student program as well.

Salib's work was supervised by Verina Baghat and Sameh Safwat.

"Sherrie learned the concept and techniques of RNA extraction and real-time PCR in the Respiratory Diagnosis and Vaccine Cohort Development Section of the lab," Baghat said. "She had the chance to practice doing an RNA extraction by herself."

All the mentors commented on how much they enjoyed working with the students, but that the major drawback of this new program was its brevity and timing during a holiday period.

Dr. Emad Mohareb, deputy head of the Research Science Directorate and lead organizer of the Winter Internship Program, agreed with the mentors, saying, "I would recommend a minimum of 15 working days in which the students have enough time to learn, practice and gain skill in what they do."



Habiba Soliman, AUC sophomore, training in the Vector Biology Research Program lab. Photo by Rafy George.

Technology Transfer Update: When to Publish, When to Patent?

By Dr. Todd Ponzio, Director, Office of Technology Transfer

SILVER SPRING, Md. - There are many federal laboratories, each with its own mission and purpose. Research in the laboratories has historically focused on discovering 'fundamental' knowledge that could lead to new breakthroughs in medical, energy and agricultural technologies. It was hoped that those breakthroughs would eventually lead to products resulting in meaningful changes in living standards such as new medicines, low-emission fuels, and drought-resistant crops. If new businesses were to be created and the economy stimulated, all the better.

To trace a product back to the original research can be challenging, and the vast majority of federal research is still not done with a clear final product in mind. However, as the federal government enters into leaner times, there is an emphasis on focusing research portfolios on 'translational' endeavors – projects that demonstrate a nearer and clearer applicability. Viewed in this context, although many federal laboratories are being encouraged to adjust from 'fundamental' to 'translational,' the researchers throughout the global Naval Medical Research Center enterprise are already there.

This is because all of our researchers have a clear end-user in mind – the warfighter. Dr. Wei-Mei Ching, a senior scientist in the Infectious Diseases Directorate's (IDD) Viral and Rickettsial Diseases Department (VRDD), is a perfect example. She studied the basic biochemistry of protein antigens from infectious pathogens in her earlier years at [NMRC](#) and is now developing rapid diagnostics for the warfighter based on her knowledge of protein chemistry.

However, discoveries such as these made within the realm of Navy Medicine have obvious applicability beyond our key constituents. For example, rapid diagnostics can as easily benefit the local population in endemic areas as the deployed warfighter, and children from Florida to Africa would benefit from a malaria vaccine just as much as a warfighter. For the most part, the translational discoveries made throughout the enterprise would never become products but for the associated intellectual property, and specifically, the related patents.

The research done within the enterprise ultimately

becomes a beneficial product through patent license agreements (PLAs). PLAs are negotiated agreements between the Navy and a commercial company focused on the patented discovery and the commercialization of an

end product. PLAs are the main instruments through which research gets translated. Presentations and publications, while certainly important, do not form the foundation of a commercial product valuable to the warfighter and the U.S. public.

The reason for this is simple economics. A patent gives a company certain advantages over its competitors in the marketplace, advantages described and claimed in the patent. Without the patent, the company would not be able to charge a certain price for its technology because a competitor would simply offer the same goods or services for less.

In non-profit research institutions there is a natural desire to publish scientific results, and it is not uncommon that a scientist's own publications prevent patenting. It is for this reason that, in the biotechnology business development world, it is often said, "The cure for cancer is sitting on the shelf

of some laboratory; but because it was published, no money can be made, and so there on the shelf it will sit." Knowing when to publish versus when to patent can be confusing, but one scientist who knows this art very well is Dr. Wei-Mei Ching.

Ching not only has scores of published manuscripts, she also has several patents. More importantly, though, her patents have commercial value and have been successfully licensed to several companies that are developing merchandise useful to the warfighter. Just this past quarter, the Office of Technology Transfer executed another PLA focused on Ching's inventions. Her studies have led to important inventions related to rickettsial diseases diagnostics and treatments. Furthermore, she has been exceptionally productive with very modest resources. Through the PLAs, her contributions will result in tangible products useful to the warfighter and beyond, and for this reason Ching has been selected by the Technology Transfer Office as the Naval Medical Research Center global enterprise INVENTOR OF THE YEAR. Our sincerest congratulations go out to Ching.



Dr. Wei-Mei Ching, selected by the Technology Transfer Office as the 2012 Inventor of the Year.

NMRC's Junior Officer of the Year

SILVER SPRING, Md. - Lt. Vince Gerbasi was selected as the [NMRC](#) Junior Officer of the Year. This award recognizes junior officers who contribute directly to the mission of the laboratory and the United States Navy and is based on sustained superior military and professional performance, military appearance, bearing and accomplishments. He will go on to compete with junior officers from the other laboratories for the NMRC Enterprise Junior Officer of the Year. Gerbasi heads the Malaria Liver Stage Laboratory. He was recently awarded a \$100,000 grant from the Bill & Melinda Gates Foundation for his work, which focuses on targeting the liver stages of malaria.



Admiral's All Hands Addresses Sequestration, Fiscal Challenges

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aligning with the Chief of Naval Operations's goals of warfighter first, operate forward, and be ready.

Doll pointed out that within the Department of Defense there are a lot of activities going on responding to fiscal constraints. He wanted the group to know that one subject being discussed is to develop a tri-service

analysis related to research. He felt it was important for all to know that the tri-service R&D discussions were going on more actively now than in the past. He said it is possible that this organization will look very different this time next year.

"I believe that despite the dynamics of sequestration, continuing resolution, the debt ceiling and the DoD tri-

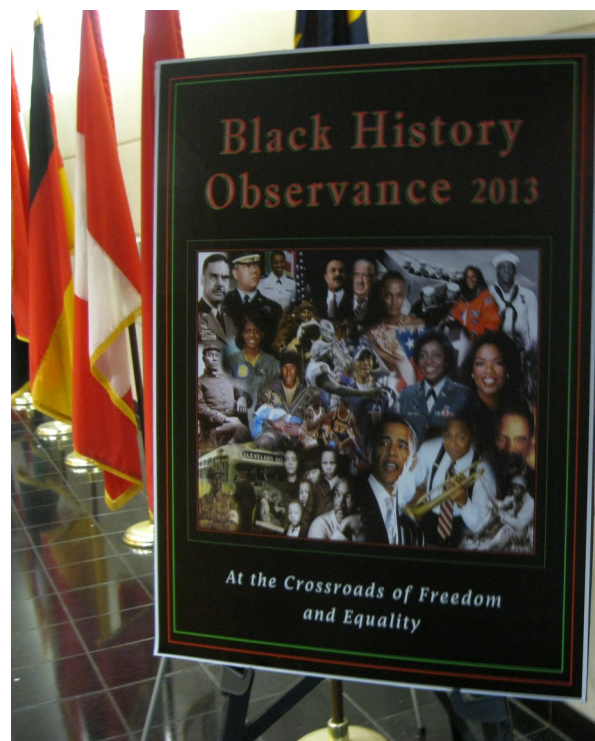
service discussions, we are charting our course. We look at the priorities that the SG has set and we have to work toward them as we support Navy Medicine and the Navy. And we have always had the people here to do that. There will be change, and that change will reflect respect for the mission and respect for the people who meet that mission."

NMRC Commemorates Black History, Black Achievements

SILVER SPRING, Md. - This year, the [Naval Medical Research Center](#) and Walter Reed Army Institute of Research Multicultural Committee worked to organize an event recognizing black history and the many accomplishments and contributions of African-Americans. For this event, the guest speaker was Dr. Ivan Ware, Lt. Col. (ret.), a Tuskegee Airman who spoke of his experience as one of America's first black military airmen. Between 1938 and 1940, three government initiatives were influential in paving the way for blacks to participate in the nation's defense and for blacks to become military pilots.

Other guests invited to the Black History Month observance included the WARR Dance Company, an all-girl dance group, who performed dances that gradually showed the change in the style of music and dance over the decades. Also, local R&B vocalist DeAngelo Redman sang a couple of well-known songs that encouraged the audience to sing along with him.

With a full house in attendance, the event provided an opportunity to remember the military accomplishments of black Americans by mentioning the first black woman soldier, Cathay Williams, and Seaman Robert Black, the first black sailor to receive a Congressional Medal of Honor in 1864. Dr. Ware made mention of these notables to inspire our men and women to remind us where we came from and where we are going.



NMRC Continues STEM Partnership with Rolling Terrace Elementary

SILVER SPRING, Md. - The Naval Medical Research Center (NMRC) is committed to promoting science, technology, engineering, and mathematics (STEM) education and community outreach efforts. This month, NMRC officers supplemented the educational efforts of the Rolling Terrace Elementary School's Electricity Unit.

NMRC has tailored laboratory demonstrations to match science units conducted by Rolling Terrace teachers. During Rolling Terrace's electricity unit, the students performed a hands-on demonstration of the activity of electrolytes in solution and how electrolytes can power a small light bulb.

"We used a small amount of laboratory salts and weak acids to demonstrate the generation of ions in water and how this process would result in the flow of electrons to power the bulb," explained Lt. Vince Gerbasi.

After the lecture and demonstration, students began thinking of environmental sources they could use to power the light bulb and were able to power the bulb with a grapefruit, a penny, and a paper clip. Through these hands-on laboratory demonstrations, students employed different hypotheses to start thinking about engineering concepts and how they might be able to use abundant energy sources from their environment to power gadgets that require electricity.



Lt. Vince Gerbasi teaches Rolling Terrace Elementary School students about electricity.

This spring, NMRC will contribute to Rolling Terrace's Cell Biology lectures and laboratory demonstrations. NMRC personnel who are interested in volunteering to teach one of the lectures can contact Gerbasi for more information.

Greetings from the NMRC Ombudsman!

Sequestration...A term that few of us knew a year ago is, today, on everyone's lips. Every news broadcast mentions it, late-night comedians include it in their monologues, and it's probably come up at your own dinner table. Sequestration refers to the across-the-board spending cuts, half of which are planned for the DoD. The truth is, no one quite knows if, when, and to what extent the DoD will be impacted. While the President has used his authority to exempt military personnel funding from sequestration, we don't know how sequestration might impact Navy operations, and the DoD may be forced to enact furloughs of our civilian colleagues. We also don't know how sequestration may impact future pay, services and benefits that military families often rely upon.

Times with this much uncertainty can be frightening. However, one way to reduce our anxiety about sequestration is to be prepared for whatever it is that may come. Perhaps the single most important preparation that any of us can make is to put our financial life in order. Financial stability and flexibility is key to contingency planning in uncertain times like these. Are you prepared if your spouse is furloughed, or military pay is frozen at current levels, or childcare services on base are drastically reduced? Don't wait until such events happen before considering how you might meet these challenges. If you haven't done so already, consider starting an emergency fund. If you already have an emergency fund, consider adding to it. Having money safely put away and knowing that you can weather the potential financial impacts of sequestration will help to ease the anxiety of our country's current budgetary stalemate.

Start that emergency fund today! The Fleet and Family Readiness website (below) is a good place to start in finding financial planning resources. If you need additional assistance, you can also use this website to find the Fleet and Family Support Center nearest you.

http://www.cnic.navy.mil/CNIC_HQ_Site/WhatWeDo/FleetandFamilyReadiness/FamilyReadiness/FleetAndFamilySupportProgram/PersonalFinances/index.htm

Military.com also has a brief, worthwhile article on what sequestration may mean to military families.

<http://paycheck-chronicles.military.com/2013/02/14/how-sequestration-will-affect-your-daily-life/>

As always, if you are in search of other resources or assistance, please don't hesitate to contact me. I can be reached by phone at (301) 233-9789 or by email at NMRC.Ombudsman@gmail.com.

Have a Fine Navy Day!
Alexandra Mora